

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (Previously Presented): A device for detecting an abnormality of a rotating body characterized in that the improvement comprises:
  - means for measuring various physical quantities of the rotating body in rotation;
  - means for extracting a signal which is synchronized with the rotation of rotating body by the data measured by the measuring means;
  - means for determining a condition of the rotating body from the signal extracted by the extracting means; and
  - abnormality warning means for giving warning of abnormality when the determining means determine that the condition of the rotating body is abnormal;
  - wherein the extracting means comprise an adaptive digital filter which extracts a signal synchronized with the rotation and picks out a signal having no correlation with the rotation by means of a data measured by the measuring means and a signal synchronized with the rotation extracted by the extracting means, and adapts the adaptive digital filter by means of the signal picked out and having no correlation with the rotation.
2. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein the various physical quantities of the rotating body measured by the measuring means is a signal correlated with vibration, sound, rotating number or rotation.
3. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein a delayed data of the data measured by the measuring means is used in extracting a signal synchronized with the rotation in the extracting means.

4. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein the data delay time corresponds to one rotation time of the rotating body.

5. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein a delay circuit to delay the data is provided on a signal line between an input portion of data from the measuring means and an adaptive digital filter.

6. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein a delay circuit to delay the data is provided on a signal line between an input portion of data from the measuring means and a comparator to extract a signal having no correlation with the rotation.

7. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein an order component generated by calculating a rotating cycle from data of rotating information among the data measured by the measuring means is used in extracting a signal synchronized with the rotation in the extracting means.

8. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 7, wherein an order component generation circuit to generate the order component is provided on a signal line between an input portion of rotation information data from the measuring means and an adaptive digital filter.

9. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein the data measured by the measuring means is sampled by a variable sampling in accordance with the data of rotating speed information of the data measured by the measuring means so as to make an apparent cycle constant in extracting a signal synchronized with the rotation in the extracting means.

10 (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 9, wherein a variable sampling circuit to perform a variable sampling is provided on the input portion of data from the measuring means.

11. (Currently Amended): A method for detecting an abnormality of a rotating body, characterized in that, by means of the device for detecting an abnormality of a rotating body as claimed in claim 1, it extracts a signal synchronized with the rotation of the rotating body from the various physical quantities of the rotating body in rotation, and detects the abnormality of the rotating body by using the extracted signal comprising:

measuring various physical quantities of the rotating body in rotation;

extracting a signal which is synchronized with the rotation of rotating body by the data measured in the measuring step;

determining a condition of the rotating body from the signal extracted in the extracting step; and

giving warning of abnormality when it is determined that the condition of the rotating body is abnormal;

wherein in the extracting step, an adaptive digital filter extracts a signal synchronized with the rotation and picks out a signal having no correlation with the rotation by means of the data measured in the measuring step and a signal synchronized with the rotation extracted in the extracting step, and the adaptive digital filter is adapted by means of the signal picked out and having no correlation with the rotation.